SOLA HD

Uninterruptible Power Systems

S3K Series

Instruction Manual

While every precaution has been taken to ensure accuracy and completeness in this manual, EGS Electrical Group, LLC. assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions.

©2009 EGS Electrical Group, LLC. All rights reserved. Specifications are subject to change without notice.

®SolaHD name and logo are registered trademarks of EGS Electrical Group, LLC. All names referred to are trademarks or registered trademarks of their respective owners.

Table of Contents

1.0 Important Safety Instructions 4

2.0 Product Description 5–6

3.0 Pre-Installation 7

4.0 Installation 7–8

5.0 Operation 9–10

6.0 Alarms 10

7.0 Software & Interface 11–12

8.0 Maintenance & Storage 12

9.0 Troubleshooting 13

10.0 Specifications 14–15

11.0 Registration & Warranty 15

1.0 IMPORTANT SAFETY INSTRUCTIONS

Thank you for selecting the S3K Series Uninterruptible Power System (UPS). This manual contains important safety instructions that should be followed during the installation and operation of your UPS. Please read all safety, installation and operating instructions before attempting to install or operate the UPS. Please adhere to all warnings on the unit and in this manual during installation and operation.

1.1 SAFETY PRECAUTIONS—SAVE THESE INSTRUCTIONS

WARNING: The UPS is intended for installation in a controlled environment.

WARNING (Fuses): To reduce the risk of fire, replace only with the same type and rating of fuse.

CAUTION: To reduce the risk of fire, connect only to a circuit provided with 20 amperes maximum branch circuit overcurrent protection in accordance with the National Electric Code, ANSI/NFPA 70.

CAUTION (UPS with Internal Batteries): Risk of electric shock! Hazardous live parts inside this unit are energized from the battery supply, even when the input ac power is disconnected.

CAUTION (No User-serviceable Parts): Risk of electric shock! Do not remove the cover—no user-seviceable parts inside. Please refer all repairs to a qualified service technician.

CAUTION: Risk of electric shock! Disconnect the UPS from the mains supply before installing a computer interface signal cable. Reconnect the power cord only after signaling interconnections are made.

CAUTION (Non-isolated Battery Supply): Risk of electric shock! The battery circuit is not isolated from the ac input. Hazardous voltage may exist between the battery terminals and the ground; test before touching.

CAUTION: Servicing of batteries should be performed or supervised by personnel knowledgeable in batteries and the required precautions. Keep unauthorized personnel away from the batteries.

CAUTION: A battery can present a risk of electric shock and high-short circuit current. The following precautions should be observed when working on batteries:

• Remove watches, rings or other metal objects.

• Use tools with insulated handles.

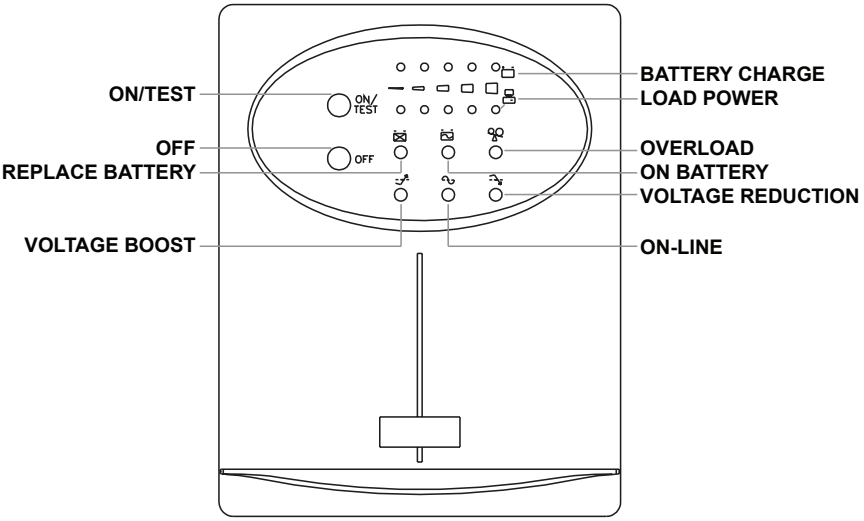
CAUTION: Do not open or mutilate the battery. Released electrolyte is harmful to the skin and eyes and may be toxic.

CAUTION: Do not dispose of batteries in a fire—they may explode.

CAUTION: When replacing batteries, replace with the same number and type.

2.0 Product Description

2.1 Front Panel



ON/TEST Button: Turns on the UPS to power the loads. It also activates the UPS self-test.

OFF Button: Turns off the UPS and the loads.

REPLACE BATTERY Indicator (Red LED): The LED illuminates when the UPS battery is no longer useful and must be replaced.

VOLTAGE BOOST Indicator (Yellow LED): The LED illuminates when the UPS is correcting a low utility voltage condition. The loads will continue to receive normal power.

BATTERY CHARGE Bar Graph: The display shows the present battery charge as a percentage of the battery capacity.

LOAD POWER Bar Graph: The display shows the power being drawn by the loads.

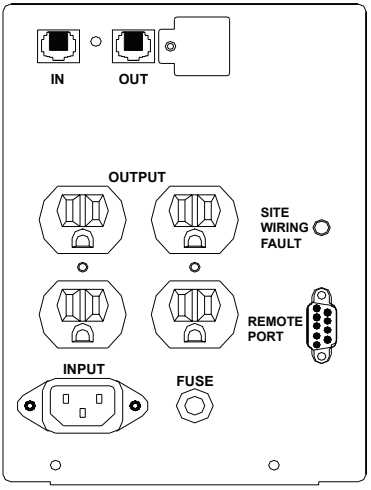
OVERLOAD Indicator (Red LED): The LED illuminates when the loads connected to the UPS exceed capacity.

ON BATTERY Indicator (Green LED): The LED illuminates when the UPS is supplying battery power to the loads.

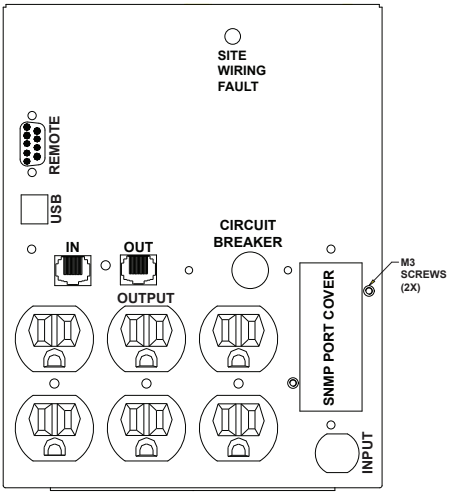
VOLTAGE REDUCTION Indicator (Yellow LED): The LED illuminates when the UPS is correcting a high utility voltage condition. The loads will continue to receive normal power.

ON-LINE Indicator (Green LED): The LED illuminates when the line input voltage is normal.

2.2 Rear Panel



S3K700 & S3K1000



S3K1600

IN/OUT (Telephone/Modem Connector): Provides surge suppression for telephones and modems.

OUTPUT: Output power receptacles for loads.

INPUT: Ac input power receptacle (line cord attached on S3K1600 models).

FUSE or CIRCUIT BREAKER: Blows when the connected loads exceed the protected receptacle's capacity. The center plungers of the fuse will extend when tripped.

SITE WIRING FAULT Indicator (Red LED): The LED illuminates when the UPS is connected to an improperly wired ac power outlet.

REMOTE PORT (Computer Interface): Provides both RS-232 and relay signals to support Windows applications and other OS compatible solutions.

SNMP PORT COVER (S3K1600 Models Only): Remove the cover to insert the .NETpower card (P/N: SNMPCARDPC).

3.0 Pre-Installation

Inspect the UPS upon receipt. Damage that may have occurred in transit is not covered under the warranty. If shipping damage is present, please contact your local carrier and SolaHD distributor immediately.

Note: The packaging material is recyclable. Please reuse or dispose of it in a responsible manner.

4.0 Installation

4.1 Installation Requirements

- Install the UPS in a protected area with adequate ventilation and free from excessive dust.
- Do not expose the UPS to corrosive air.
- Avoid direct sunlight, rain and high humidity.
- Do not operate the UPS where the temperature and humidity are out of the specified limits (operating temperature: 0°C to +40°C; humidity: 0% to 95%). Keep away from fire and extremely hot locations.
- Maintain a clearance of 4 inches (100 mm) between the UPS rear panel and the wall and 1 inch (25.4 mm) between the UPS sides and the wall. Keep the air inlets unobstructed to facilitate ventilation and heat dissipation.
- Do not stack materials on top of the UPS.
- Never leave the UPS on an uneven surface.

4.2 Installation Instructions

4.2.1 Connect to Utility Power

Connect the UPS line cord to the IEC INPUT receptacle on the rear panel of the UPS (line cord already attached on S3K1600 models). Connect the other end of the line cord to the ac input power outlet.

4.2.2 Charge the Battery

The UPS charges its battery whenever it is connected to utility power, even when the unit is off. For best results, charge the battery for 8 hours before initial use.

4.2.3 Turn On the UPS

Press the ON/TEST button.

4.2.4 Connect the Loads

Connect the loads to the OUTPUT receptacles on the rear panel of the UPS.

CAUTION: Never connect a laser printer or plotter to the UPS with other computer equipment. Laser printers and/or plotters will require their own UPS, as they periodically experience high inrush surge currents, which may cause an overload.

Note: Be careful not to overload the UPS. An audible alarm will beep continuously and the front panel OVERLOAD LED will illuminate to indicate an overload status. The UPS will shut down automatically to protect its internal circuitry.

4.2.5 Check the Site Wiring Fault Indicator

After completing the above steps, check the SITE WIRING FAULT indicator on the rear panel of the UPS. A light will be present if the UPS is plugged into an improperly wired ac power outlet. Detected wiring faults include ground and hot-neutral polarity reversal.

4.2.6 Connect the Telephone or Modem (if applicable)

Connect the source line to the IN connector. Connect the equipment to the OUT connector.

CAUTION: To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

4.2.7 Connect Computer Interface

UPSMON software (or other power management software) and an optional interface kit can be used with this UPS. If used, connect the interface cable to the REMOTE PORT on the rear panel of the UPS and to the host computer (either COM 1 or COM 2).

CAUTION: Use only factory supplied or authorized UPS interface cables!

Note: Computer interface connection is optional. The UPS works properly without a computer interface connection.

Note: Only use kits supplied or approved by the manufacturer.

4.2.8 Install the Optional .NETpower Card (S3K1600 Models Only)

Remove the SNMP port cover. Insert the .NETpower card (P/N: SNMPCARDPC) and secure with screws. Use network cables (supplied by user) to connect the UPS to the computer network port.

Please refer to the .NETpower card CD-ROM for configuration settings and further instructions.

5.0 Operation

5.1 Switch On

Press the ON button for at least 0.5 seconds.

Note: If normal utility power is not present, the UPS may be engaged by depressing the ON button for at least 3 seconds. The load will be powered from the internal batteries until the discharge point is reached.

5.2 Switch Off

Hold the OFF button until the ON-LINE or ON BATTERY LEDs are no longer illuminated.

5.3 Silence

When the UPS is in backup mode, press the ON button for at least 1 second to silence the audible alarm. (This function is disabled when the UPS status is either LOW BATTERY or OVERLOAD.)

Note: In backup mode, the UPS will automatically turn off if the connected loads are not operating.

5.4 Self-test

Use the self-test function to verify both the operation of the UPS and the condition of the batteries.

With normal utility power, push the ON/TEST button for at least 1 second. During the self-test, the UPS operates in backup mode (green LED is illuminated). If the UPS passes the self-test, it returns to line-interactive mode. (The ON BATTERY LED goes off and the ON-LINE LED goes on steadily.)

If the UPS has failed to pass the self-test, it returns to line-interactive mode and the REPLACE BATTERY LED illuminates. (The loads are not affected.) Recharge the batteries overnight and perform the self-test again. If the REPLACE BATTERY LED is still on, contact your local SolaHD distributor for a replacement.

Note: When replacing the internal batteries (12 V/7 Ah), disconnect utility power before opening the case. Take note of the polarity before installing the new batteries to avoid a short circuit.

5.5 Load Power Bar Graph

The 5-LED display shows the power drawn from the UPS by the load. The display indicates the percentage of the UPS's rated capacity. For example: If three LEDs are lit, the load is drawing between 50% and 67% of the UPS's capacity. If the UPS is overloaded, the overload LED illuminates and the alarm sounds.

5.6 Battery Charge Bar Graph

The 5-LED display shows the present charge of the UPS's batteries as a percentage of the batteries' capacity. When all five LEDs are illuminated, the batteries are fully charged. When only two LEDs are illuminated, the batteries can supply less than 2 minutes of run time for the load.

5.7 Cold Start

When the UPS is off and there is no utility power, you can use the cold start feature to apply power to the loads from the UPS's batteries. Press the ON/TEST button until the UPS beeps.

5.8 Shutdown Mode

In shutdown mode, the UPS stops supplying power to the load and waits for the return of utility power. If there is no utility power present, external devices (e.g. servers) connected to the computer interface can command the UPS to shutdown. This is normally done to preserve battery capacity after the graceful shutdown of protected servers. The UPS will scroll the front panel indicators sequentially in shutdown mode.

6.0 Alarms

6.1 Backup (slow beeping)

When the UPS is operating in backup mode, the UPS will sound an audible alarm with a beep every four seconds. The alarm stops when the UPS returns to the line-interactive mode. The alarm may be silence by pressing the ON/TEST button while in backup mode. Press the ON/TEST button again to reactivate the sound.

6.2 Low Battery (rapid beeping)

In backup mode when the energy of batteries reaches lower levels (about 20%–30%), the UPS beeps rapidly until it shuts down from battery exhaustion or returns to line-interactive mode. The low battery alarm cannot be silenced.

6.3 Overload (continuous beeping)

When the UPS output exceeds 100% of nominal for 20 seconds or 125% for 2 seconds, an audible alarm will sound and the front panel OVERLOAD LED will illuminate. The UPS will shut down automatically to protect its internal circuitry.

7.0 Software & Interface

7.1 Power Monitoring Software

UPSMON software (or other power monitoring software) utilizes a standard RS-232 interface to perform monitoring functions and an orderly shutdown of the protected equipment in the event of power failure. UPSMON displays all the diagnostic symptoms on the monitor, including voltage, frequency and battery levels. UPSMON is available for Windows applications and other OS compatible solutions.

7.2 .NETpower Card (optional—S3K1600 models only)

The .NETpower card (P/N: SNMPCARDPC) provides an advanced, yet easy-to-use network management function which supports both SNMP and HTTP. Features include: multiple system shutdown, event notification, scheduling, and control and configuration of the UPS remotely.

The .NETpower card must be inserted into the SNMP PORT on the rear panel of the UPS. Please refer to the .NETpower card CD-ROM for further instructions.

7.3 Interface Kits (optional)

Interface kits include a required interface cable to convert status signals from the UPS into signals which an individual operating system will recognize.

The interface cable must be connected to the REMOTE PORT on the rear panel of the UPS and to the host computer (either COM 1 or COM 2). Please refer to the READ.ME file for further instructions.

CAUTION: Use only factory supplied or authorized UPS interface cables!

7.4 Remote Port (computer interface)

The REMOTE PORT on the rear panel of the UPS may be connected to a host computer to allow for UPS status monitoring and operation control. Functions include:

- Broadcasting a warning when power fails;
- Closing any open file before the batteries are exhausted;
- Turning off the UPS.

Please refer to 7.4.1 on page 12 for Remote Port PIN Configurations.

7.4.1 Remote Port PIN Configurations

PIN	Description	I/O
2	Power fail. Generates a high to low signal when the line fails. **Notes:** Normally open status; closed when active. Open collector output must be pulled up to a common referenced supply no greater than +40 V dc. The transistors are capable of a maximum non-inductive dc load of 25 mA. Use only pin 4 as the common.	Output
4	Reference ground for PINs 2 & 5	N/A
5	Battery low. Generates a high to low signal when the internal battery of the UPS has less than 5 minutes of backup time remaining. **Notes:** Normally open status; closed when active. Open collector output must be pulled up to a common referenced supply no greater than +40 V dc. The transistors are capable of a maximum non-inductive dc load of 25 mA. Use only pin 4 as the common.	Output
6	Remote shutdown of the UPS **Notes:** PIN 6 has a multi-purpose functionality: (1) Will shut down the UPS when a high RS-232 level is sustained on PIN 6 for 0.36 seconds; (2) Is the RS-232 data input (R x D). Keep this pin at high voltage (+5 V to +12 V) for 500 ms to shutdown the UPS. Activates when in the battery mode only.	Input
7	Reference ground for PIN 6	N/A
9	RS-232 data output	Output
Note: PINS 2 and 5 rating: +40 V dc, 25 mA non-inductive		

8.0 Maintenance & Storage

8.1 Maintenance

- Keep the unit clean (wipe with a soft, damp cloth) and vacuum the ventilation intake periodically.
- Check for loose and bad connections monthly.

8.2 Storage Conditions

- Before storing, charge the UPS's batteries for at least 4 hours.
- Store the UPS covered and upright in a cool, dry location, with the batteries fully charged.
- To avoid unnecessary draining of the batteries, remove any accessories in the accessory slot and disconnect any cables connected to the REMOTE PORT.
- During extended storage in environments where the ambient temperature is -15°C to +30°C (+5°F to +86°F), charge the UPS's batteries every 6 months; +30°C to +45°C (+86°F to +113°F), charge the UPS's batteries every 3 months.

9.0 Troubleshooting

Problem	Probable Cause	Solution
UPS won't operate after pressing the ON/TEST or OFF button **No LEDs; no warning sounds**	Problem with input power source	Check the input power source
	Fuse blown on rear panel	Replace fuse with same type and rating and check load
	ON/TEST button was not pressed for 1+ seconds	Press the ON/TEST button for more than 2 seconds
	Output short circuit or overload on UPS	Turn off UPS. Remove all loads to ensure there are no problems or internal short circuits. Press the ON/TEST button for more than 2 seconds.
Indicates no utility with a warning every few seconds	No power source input	Check the input power source
	Fuse blown on rear panel	Replace fuse with same type and rating and check load
Fault light is on and the alarm keeps beeping	UPS needs repair	Contact your distributor or Technical Support for assistance
Continuous beeping	Overload condition	Remove the overload. Refer to the output specifications.
Utility indicator light is on	Fuse blown on the rear panel	Replace fuse with same type and rating and check load
UPS has reduced battery time	Batteries are not fully charged	Recharge the UPS for at least 4 hours
	UPS overload	Check the load power display and remove any non-essential loads
	Batteries are aged and can't be fully charged	Replace the batteries. Contact your distributor or Technical Support for assistance.
Battery light flashes when power of UPS is supplied by utility	Voltage of batteries is too low	Recharge the UPS for at least 4 hours
	Batteries are disconnected	Check the connections
	Damage present on battery packs	Replace the battery packs immediately
For further assistance, please contact SolaHD Technical Support at: **U.S.: (800) 377-4384 • International: (847) 268-6651 • E-mail: tech@solahd.com**		

10.0 Specifications

Parameter	Catalog Number		
	S3K700	S3K1000	S3K1600
Capacity	700 VA/480 W	1000 VA/750 W	1440 VA/1200 W
INPUT			
Nominal Voltage	120 V ±25%, single phase		
Frequency	50 or 60 Hz ±5% (auto-sensing)		
OUTPUT			
Voltage (on battery)	Pure sine wave output at nominal ±5%		
Frequency (on battery)	50 or 60 Hz ±0.5%		
Voltage Regulation (AVR)	AVR automatically increases output voltage 15% above input voltage if -9% to -25% of nominal is detected. AVR decreases output voltage 15% below input voltage if +9% to +25% of nominal is detected.		
PROTECTION & FILTERING			
Spike Protection	320 J, 2 ms		
Unit Input	Fuse for overload & short circuit protection		
EMI/RFI Filter	10 dB at 0.15 MHz; 50 dB at 30 MHz		
Overload Protection	UPS automatically shuts down if overload exceeds 100% of nominal at 20 s and 125% at 2 s		
Transfer Time	2–4 ms, including detection time		
Short Circuit	UPS output cuts off immediately or input fuse protection		
ENVIRONMENT			
Operating Temperature	0°C to +40°C		
Humidity	0 to 95%, non-condensing		
Maximum Elevation	10,000 ft. (3,000 m)		
Audible Noise	<40 dBA (1 m from surface)	<45 dBA (1 m from surface)	
PHYSICAL			
Dimensions (W x D x H), inches [mm]	5.5 x 17.2 x 8.27 [140 x 436 x 210]		6.7 x 17.7 x 8.9 [170 x 450 x 226]
Net Weight, lb. [kg]	31.9 [14.5]	34.8 [15.8]	66.0 [30.0]
Shipping Weight, lb. [kg]	34.1 [15.5]	37.0 [16.8]	70.4 [32.0]
Input Inlet	IEC 320 power inlet to 5-15P plug line cord		Attached cord to 5-15P
Output Receptacles	(4) NEMA 5-15R		(6) NEMA 5-15R
BATTERY			
Type	Hot swappable, sealed, maintenance-free, lead acid		
Typical Recharge Time	4 hours (to 90% of full capacity)		
Protection	Automatic self-test & discharge protection. Replace battery indicator.		
Backup Time	10–30 min. (depending on the load)		

Parameter	Catalog Number		
	S3K700	S3K1000	S3K1600
Backup Time at Full Load	5 min.	3.5 min.	3 min.
Backup Time at Half Load	14 min.	12.5 min.	10 min.
ALARMS			
Battery Backup	Slow beeping sound (about 0.25 Hz)		
Battery Low	Rapid beeping sound (about 1.0 Hz)		
Overload	Continuous beeping sound		
INTERFACE			
RS-232 Interface	Bidirectional communication port		
USB	N/A		USB port
COMMUNICATION			
Option Card	N/A		.NETpower card (P/N: SNMPCARDPC)
AGENCY APPROVALS			
Safety	UL1778, CAN/CSA-C22.2 No. 107, FCC Part 15 Subpart B Class B (1998)		

11.0 Registration & Warranty

11.1 Product Registration

To register your product for updates and information on service and support, visit our Web site at: http://www.solahd.com/support/registration.htm

11.2 Warranty Information

Please see the enclosed “Terms & Conditions of Sale”.

SOLAHD

Technical Support
U.S.: (800) 377-4384
International: (847) 268-6651
E-mail: tech@solahd.com
Web site: www.solahd.com

EMERSON™
Industrial Automation

Part Number: A272-076 Rev 3
August 24, 2009